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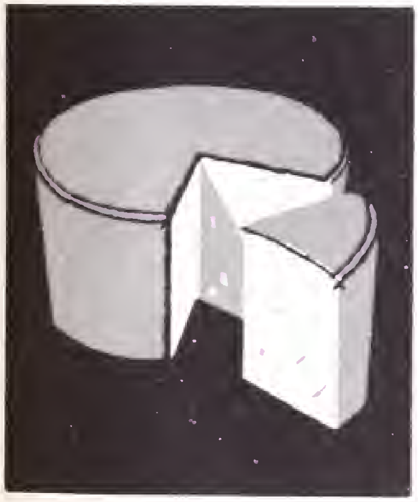
Farm-to-Retail Price Spreads for CHEDDAR CHEESE in the South



Agricultural Marketing Service
Marketing Research Division
U. S. DEPARTMENT OF AGRICULTURE
in cooperation with the
UNIVERSITY OF TENNESSEE

PREFACE

This report on marketing costs and margins for cheddar cheese is one of a series issued by the Marketing Research Division, Agricultural Marketing Service to meet the need for more information on farm-retail price spreads on food. The reports are part of a broad program of research designed to reduce the cost of marketing farm products.

Interest in price spreads has grown considerably in recent years. This interest is shown not only by the agricultural segment of our economy but also by marketing agencies, governmental bodies, and the consuming public. Price spreads for cheddar cheese may be of particular interest for several reasons--cheese is one of the major products of milk; it is a staple food item; and it is one of the three products purchased and stored by the Federal Government as a means of supporting the farm price for milk.

This report is based upon case studies of eight individual lots of cheddar cheese produced and marketed in the southeastern section of the United State.

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SUMMARY

This report deals with the marketing methods and price spreads for cheddar American cheese. A study was made of the marketing charges and channels for cheddar cheese produced and marketed in the southeastern section of the United States. Eight selected lots of cheese were analyzed as to costs and merchandising methods from the time the whole milk was received at the plant until the cheese was offered for sale by retailers. The 8 lots of cheese were produced in 4 different manufacturing plants at different times of the year.

For the 8 lots of cheese studied, total plant costs for producing cheese ranged from 30.2 to 35.5 cents per pound. Of this total, the cost of milk--or raw product--ranged from 23.0 to 26.3 cents. Plant labor was the largest manufacturing cost item. Other important items of cost were for packaging, building and equipment depreciation, utilities, and direct and indirect supplies.

Prices to consumers ranged from 39 to 69 cents per pound; farm-to-retail price spreads varied from 17 cents to 48 cents; and the farmer's share of the consumer's dollar ranged from 31 to 56 percent. Retail prices were lowest on "weekend specials" in supermarkets and highest in small country stores.

FARM-TO-RETAIL PRICE SPREADS FOR CHEDDAR CHEESE IN THE SOUTH

By Irving Dubov and D. D. MacPherson [1]

INTRODUCTION

Marketing practices for many food products have changed rapidly in recent years. The changes resulted from many factors--technological advances in farm production, food processing and merchandising; consumers' income, tastes, and preferences; and relative prices of individual food products.

Marketing costs, measured by the price spreads between the prices received by farmers and prices paid by consumers, reflect these changes. This is evident in the dairy products processing and merchandising industry.

One of the more important uses of milk in the United States is in the manufacturing of cheese. During 1946-56, American cheese alone used more than 8 percent of all milk. Annual production of American cheese averaged more than 900 million pounds during this period.

The farm-retail price spread for cheddar cheese is the difference between the retail price paid by the consumer for a pound of the product, and the net amount that the farmer received for the quantity of milk used to produce 1 pound of the product. This difference--or price spread--is the charges for performing the marketing functions necessary to bring the finished product to the consumer: Collection and assembly of the raw product from farms, processing in the plant, handling and storage in the plant, movement to a distributing point, storage and handling at a distributing point, movement to the retailer, and storage and handling by the retailer.

Generally, about 10 pounds of whole milk are required to produce 1 pound of cheese. The amount required for a specific lot of cheese, however, is affected by the moisture content of the cheese, the solids content of the milk used, and other factors. For example, if milk with a relatively high solids content is used, only about 9 pounds may be needed to produce a pound of cheese.

THE CHEDDAR CHEESE INDUSTRY

Many different types of cheese are produced in the United States. The most common are cottage cheese, swiss cheese, and cheddar cheese. This latter product, known also as American natural cheese, is sold to consumers after aging in its original state, or is manufactured into American processed cheese or into a wide variety of cheese foods. The cheddar cheese industry is the third most important utilizer of milk in this country--only fluid milk and butter account for more. In addition, whey cream butter, a cheese byproduct, accounts for some 3 percent of total butter production. The production of cheddar cheese has nearly tripled in the past 30 years. During this same period, total milk production has increased less than 30 percent. Consequently, the importance of cheddar cheese manufacturing as an outlet for milk has increased considerably. In the 1920's a little less than 4 percent of the total milk produced on farms was used for cheddar cheese; since 1947 this figure has averaged slightly more than 8 percent (fig. 1). Production during 1952-57 has averaged over 1 billion pounds per year.

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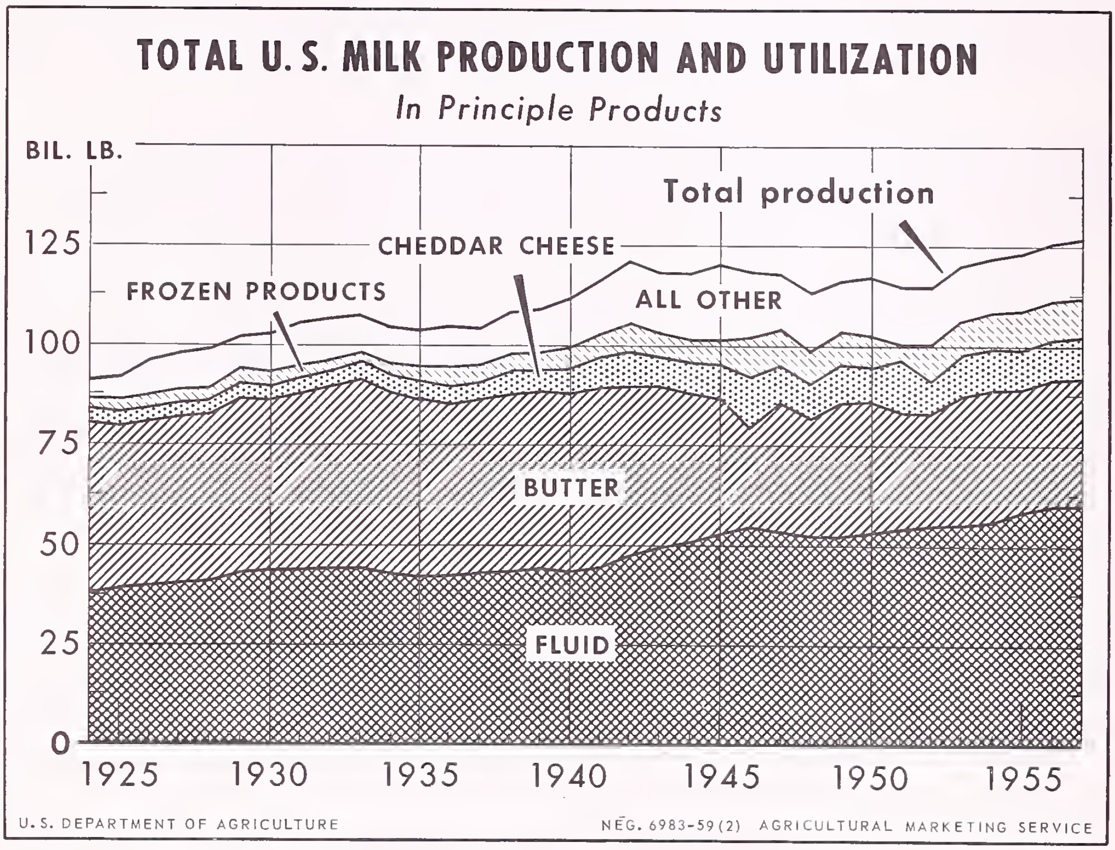

Figure 1

American cheese was produced in 36 States in 1956. Well over half of the entire national production was in the East North Central States, with Wisconsin alone accounting for about 45 percent of the total of 991 million pounds. Other major cheese-producing States and their percentage of total production that year are as follows: Missouri, 9.4 percent; Minnesota, 4.8 percent; Kentucky, 4.7 percent; Illinois, 4.2 percent; and Tennessee, 3.9 percent. Production follows a rather definite seasonal pattern, with over one-third of the total produced in May, June, and July, and less than one-fifth in November, December, and January.

There have been substantial changes in both production and marketing of cheese in recent years. One of these has been a decline in the number of cheese plants. The decline was caused by a number of factors: (1) Competition for milk supplies has increased as a result of the expansion of fluid milk markets. Producers who formerly had no outlet except cheese plants have upgraded the quality of their milk to make it acceptable for fluid use. (2) Improved transportation permits plants of all types to reach out farther for their milk supply. (3) Public health regulations have become more stringent in requirements for treating dairy waste products. Small plants unable to meet these requirements are forced out of business. (4) In many instances, a group of small, relatively inefficient crossroads plants have closed down and concentrated all of their operations in a single, large, and more efficient plant. These factors, and others, have reduced the number of American cheese plants from the alltime high of 2,464 in 1942, to 1,272 in 1956.

Marketing has also undergone changes. In some instances, large chain-store organizations purchase directly from the cheese manufacturing plants, thus eliminating the assemblers, jobbers, and wholesalers as independent marketing agencies. In other instances, cheese manufacturing plants have set up their own sales organizations to perform these intermediary functions. Prepackaging has become common; manufacturers cut and wrap the cheese into consumer packages, taking over a function formerly performed by the retailer. Finally, production of processed cheese and cheese foods has grown rapidly, profoundly affecting the market for cheddar cheese.

These changes in manufacturing and marketing operations during the past 2 decades have had far-reaching effects on the whole cheddar cheese industry--on retail prices, manufacturing costs, returns to farmers, and farm-retail price spreads.

CHANGES IN FARM-RETAIL PRICE SPREADS FOR CHEDDAR CHEESE

The Department of Agriculture regularly collects data on average prices paid for milk used in manufactured dairy products. The Bureau of Labor Statistics collects data on average prices paid by consumers. From these data, farm-retail price spreads, farm values, and the farmer's share of the consumer's dollar are computed.

During 1924-57, farm values and retail prices have generally moved in the same direction and about the same amount (fig. 2). Both have changed more rapidly and by larger amounts than the manufacturing and merchandising charges (farm-retail spread).

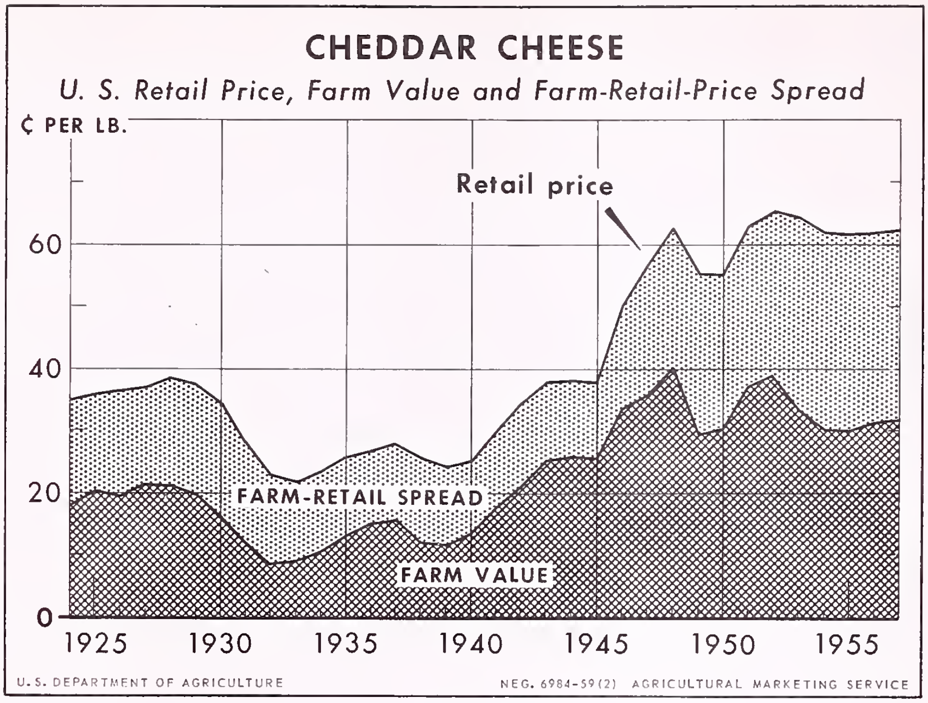

Figure 2

The changes in retail price, farm value, and farm-retail spread during 1924-57 can be related to rather definite periods:

1. During the prosperity of the early 1920's, retail prices, farm values, and farm-retail price spreads all rose fairly steadily and reached their peaks in 1928 or 1929.

2. During the depression, farm values dropped rapidly, falling from 21.0 cents in 1928 to 8.5 cents in 1932. Farm-retail price spreads, on the other hand, dropped more slowly but for a considerably longer time--from 18.6 cents in 1930 to 11.4 cents in 1936.

3. Farm values recovered considerably during the midthirties and reached 15.6 cents in 1937. Price spreads increased in 1937. Both farm values and price spreads, however, declined in the recession period of 1938-40.

4. Farm values rose very rapidly with World War II prosperity; the 25.2 cents in 1943 was more than double the 11.7 cents in 1939. The farm-retail price spread remained fairly stable, between 11.4 and 13.7 cents, from 1933 through 1945.

5. Under the combined influence of price controls and Government payments made directly to farmers and to cheese manufacturers, retail prices and farm values were virtually unchanged in 1944 and 1945.

After the removal of price controls in 1945 and discontinuance of direct payments retail prices rose from 37.8 cents in 1945 to 62.8 cents in 1948, farm values from 25.5 cents to 40.1 cents, and price spreads from 12.3 cents to 22.7 cents.

6. During the 1948-49 recession, farm values dropped by a fourth, but price spreads increased.

7. Farm values during the Korean War reached 38.8 cents. In 1952, the retail price was 64.7 cents, the highest on record. The price spread remained at the 1949 level.

8. In 1953 and 1954, after the Korean War, farm values fell from 38.8 cents to 30.2 cents. However, retail prices declined by less than 3 cents. Price spreads continued to increase--from 25.9 cents to 31.6 cents.

9. Since 1954, under the combined influence of surpluses and price supports, farm value has remained nearly unchanged from the 1954 level. Retail prices and price spreads also have changed little.

CASE STUDIES

This report deals with the production and marketing of 8 individual lots of cheese. Each lot was followed, step-by-step, from the time the milk left the farm until the cheese was sold to the consumer. This type of study was made because average data for all cheese provide little information about many important details of cheese production and marketing. Cheddar cheeses are individual products manufactured by a batch process. Each batch (lot) has an identity; it has particular characteristics of moisture content, butterfat and other milk solids, consistency, flavor, and odor. It may be covered with paraffin or may be wrapped in a film of plastic. It may be sold while new and "mild" or it may be sold after it has been aged and becomes "sharp." It moves through different marketing channels. The customer may buy the cheese by the slice in a small country store or in a prepackaged piece in a supermarket.

These case studies should not be considered as typical in all areas of the United States. They do tell, however, the steps, costs, and margins involved in producing and marketing 8 lots of cheese in particular producing areas. These studies were undertaken and this report was prepared to bring a greater understanding of the production and marketing process in the selected area.

The lots of cheese described in this study were produced in 2 States in the Southeast. Of the many factors considered, 2 were dominant in determining the general geographic area of the study. First, these 2 States are the second and sixth most important States in cheese production. Second, prices received by farmers for milk used in manufactured dairy products have been and continue to be lower in the South than in the Midwest dairy area. 2/

Other factors were considered in selecting the individual cases. Prices paid to farmers for milk and volumes of milk processed vary considerably during the year. Of the 8 lots covered in this study, 2 were processed in the spring when milk supplies are largest; 2 were processed in the late fall when milk supplies are smallest; and 2 were processed in each of the inbetween periods of midwinter and late summer when milk supplies are intermediate.

The size of the processing plant and the marketing channels were also considered. This latter factor is of importance for illustrating the variations in the ways that cheese moves from the processing plant to the customer.

Generally, each lot of cheese was followed from the time the milk was received by the manufacturing plant until the cheese was retailed, and data were collected at each step in the manufacturing and marketing processes. The point of departure for the study was the individual cheese plant. Data collected at the plant included prices paid producers, the amount of milk used for the lot, the number of pounds of cheese produced, the various manufacturing costs, and the selling prices. Since no 2 of the 4 plants from which data were collected used a common accounting procedure, it was necessary to develop standard procedures that would allow valid comparisons among the different lots of cheese. For example, in determining depreciation costs for facilities, arbitrary depreciation rates based on original costs were used: Five percent for buildings and 10 percent for plant, office, and shop equipment.

Observers maintained contact with the plant and arranged to be present when the cheese was loaded out of the plant for movement to the next buyer; they followed parts of each lot through each step in the marketing channels. Prices, costs, marketing practices, and other information were determined at each step.

STEPS IN THE MARKETING PROCESS

While each lot of cheese had some individual marketing features, all of the lots moved through certain common steps: Assembly of milk; manufacturing of cheese; movement of cheese through a jobber to a wholesale agency, or movement to out-of-plant storage or to a chainstore company; storage of cheese before movement to another wholesale agency (in some cases); movement of cheese to a retailer; and handling, packaging, and sale to the consumer.

2/ For evidence see "Milk Prices Paid by Creameries and Cheese Plants." Monthly Publication, U. S. Dept. Agr., Agr. Mktg. Serv. Chicago, Ill.

Another study of marketing costs and margins for cheese is in process in the Midwest dairy area. This study may provide some insights into differences in prices paid in the South and Midwest.

Assembly.--The first step in the marketing process was the assembly of milk from the individual farms. Most of the milk was picked up daily at the farm, by contract haulers. Nearly all of the milk was hauled in cans. The contract for hauling was between the individual farmer and the hauler; rates paid ranged between 30 and 40 cents per hundredweight of milk. In one instance, the cheese plant paid a subsidy to the hauler. In some instances, farmers hauled their own milk to the plant and thus paid no hauling fee.

Manufacturing.--The manufacture of cheese involves a number of steps. Milk is unloaded from the trucks at the receiving platform. There the cans are opened, the milk is checked for off-odors, and all of the milk for an individual producer is dumped into a weighing vat, where a sample is taken and the weight is recorded. The milk is then transferred to a holding tank. The next step is to standardize the milk to the desired butterfat content of 3.6 to 3.8 percent; this is done by removing the excess butterfat which is then processed into butter, if facilities are available, or sold to a butter plant. After pasteurizing, the milk is transferred to the cheese vat and coloring, starter, and rennet are added. The milk is heated during this operation and close attention is given to acidity, temperature, and curd set. At the proper stage, the curd is cut and the whey is tested. At the proper point, the whey is drained and the remaining curd is cheddared (allowed to become matted). Next the curd is milled (cut into small pieces), salt is added and the curd is put into cheese hoops and placed in a press. Later the hoops are removed and the surface of the cheese is allowed to dry. Then paraffin coating is applied. The individual cheeses in the lot are weighed, lot identification is attached, and the cheese is transferred to refrigerated space for curing and aging. After proper curing the cheese is transferred to out-plant storage or to a wholesale agency.

The sample of the individual farm's milk, taken during the receiving operation, is tested for butterfat content to determine the amount of payment due to each farmer. In this study farmers were paid on 1 of 2 bases: (a) Pounds of butterfat delivered or (b) a basic rate per hundredweight of milk of a specified butterfat content plus or minus a differential computed by the amount the actual butterfat content varied from the hundredweight butterfat basis.

Before, during, and after the above manufacturing steps, many collateral operations are necessary: Setting up tubing for the milk lines, the pumps, and other equipment; setting up and bandaging the hoops; cleaning and sterilizing all of the equipment. There are, of course, other necessary functions such as keeping records, making payments to farmers for milk, and other office work.

Movement from plant.--After proper curing the cheese is transferred either to a cold-storage house or directly to a wholesaler or retail chainstore. In either case the transportation cost is paid by the plant. For 7 of the 8 lots in this study, sales were made through a broker whose fee was paid by the plant.

Wholesaling.--When the product moved through this channel, wholesalers picked up the cheese at the cold-storage house and delivered it to individual retail customers.

Retailing.--Retailers displayed the cheese in refrigerated space. They also cut, weighed, and wrapped the cheese for the consumers.

Since the individual lots were chosen on the basis of differing characteristics, any averages for all lots have limited meaning. Each lot differs from the other 7 and the average for all 8 lots is not representative of any one lot.

However, since the lots were produced in 4 different plants in 4 different seasons, and reached consumers through 21 differing marketing channels, some comment may be made on the ranges and on a few limited comparisons. The ranges and prices given here are not all-inclusive even for the particular lot; while the prices paid farmers and the manufacturing costs do cover all of each specific lot, other costs and margins are applicable only to those segments of each lot that were followed through wholesaling and retailing channels.

A composite table of minimums and maximums for the 8 lots shows that prices paid by consumers ranged from 39 to 69 cents per pound (the reported national average price at this time was about 62 cents). Wholesale prices varied from 37 to 44 cents and retail price spreads varied from 1 to 30 cents. The 1-cent spread was for cheese sold on a weekend special in a supermarket while the 30-cent spread was for cheese sold in a small country store (table 1).

Prices received by manufacturing plants (except for 1 lot which was sold by the plant directly to a retail outlet) fell within the narrow range of 35.0 to 36.5 cents. Wholesale spreads varied from 1 to 8 cents and total wholesale and retail spreads varied from 3.5 to 33.0 cents.

The lowest price paid for the milk used in a pound of cheese was 22.9 cents and the highest was 26.3 cents. Total price spread for manufacturing (again not including 1 lot where the plant did some prepackaging and sold directly to retail outlets) varied from 9.0 to 12.7 cents. Manufacturing costs varied from 6.0 to 9.8 cents and the processing-plant margins ranged from a loss of 0.1 cent to a profit of 4.9 cents.

Farmers paid hauling costs, on a pound of cheese equivalent basis, of 2.7 to 4.1 cents and received, after hauling, 18.9 to 21.9 cents.

The net amount received by the farmers in this area may appear low compared to the national average of about 31 cents for the same period of time. However, the farm values per pound of cheese in this study are not directly comparable to the national average for 2 important reasons:

First, the amount of milk required to produce a pound of cheese is dependent, among other factors, on the solids content of the milk used. Most

Table 1.--Eight lots of cheddar cheese--minimum and maximum prices, price spreads, and returns to farmers per pound of cheese 1/

Item	Minimums	Maximums
	Cents	Cents
Retail price	39.0	69.0
Wholesale price	37.0	44.0
Retail spread	1.0	30.0
Prices paid by wholesaler	35.0	36.5
Wholesale spread	1.0	8.0
Total retail-wholesale spread	3.5	33.0
Amount paid to farmers	23.0	26.3
Total manufacturing plant spread	9.0	2/ 19.0
Manufacturing cost	6.0	2/ 15.3
Residual plant margin	-0.1	2/ 8.8
Transportation paid by farmers	2.7	4.1
Net price to farmers	18.9	21.9
Total spread	17.2	47.7
	Percent	Percent
Farmer's share	31	56

1/ The data presented in this table do not balance arithmetically since each individual item is either the lowest or the highest from among any one of the 8 lots.

2/ These relatively high amounts occurred in lots that were prepackaged or wholesaled directly by the cheese manufacturing plant.

cheese, on a nationwide basis, is produced from milk that contains less than 4 percent of butterfat when received from farmers. The cheese covered by this study was produced from milk that had a butterfat content of 4.2 to 4.6 percent when received from farmers. This milk also had a higher content of other milk solids, most of which remained in the milk when it was standardized by removing some of the butterfat. Less milk is needed to make a pound of cheese if the raw milk has a high butterfat content than if it has a low butterfat content. For the national average farmers were paid 31 cents for slightly more than 10 pounds of raw milk; in these case studies farmers were paid 18.9 to 21.9 cents for, on the average, slightly less than 9 pounds of milk.

Second, the method used to compute the farm value in the national average is different from the method used in this study. In the national average, the farm value is the full price paid for milk at the plant. In this study the farm value is the net amount that the farmers receive for milk that goes into cheese; this net value is computed by deducting from the plant price the cost of hauling milk from the farm to the plant and the value of byproducts. Thes byproducts were the cream recovered by standardization and the whey cream (se table 3 for illustration of computation of net farm value).

The farmer's share of the consumer's dollar varied from 31 percent to 56 percent. For 6 of the 8 lots it was 44 percent or less. This appears low compared to the national average of 50 percent, for reasons pointed out in th above discussion of prices received by farmers.

The total price spread ranged from 17.2 to 47.7 cents. The midpoint of this range is almost the same as the national average of about 31 cents.

Some limited comparisons may be made on lots of cheese produced at different times of the year. Lots 1 and 2 were produced in the same plant durin the winter months; lot 6 was produced by this plant in the summer. Lots 3, 7 and 8 were produced in the same plant--lot 3 in the spring and lots 7 and 8 i the fall (table 2).

Since the retail price variations for lots 1, 2, and 6 were due to the particular segment followed, comparison of these prices is not practicable. The price received for lot 6, produced in the summer, was 39.0 cents, 1.5 cents higher than the lowest price for the cheese produced in the winter (lots 1 and 2), but 5 cents lower than the highest winter price.

Prices paid by the wholesaler to the plants varied but little. The cost for the milk equivalent of a pound of cheese was about 0.8 cent higher in the summer, but manufacturing costs were 2.5 cents per pound less.

Net margins of manufacturing plants for lots produced in the winter ranged from 0.08 cent to 0.72 while the margin was 1.88 cents for the lot produced in the summer. The net price to farmers was, therefore, about 0.8 cent higher in the summer.

Lots 3, 7, and 8 were produced by the same plant--lot 3 in the spring an lots 7 and 8 in the fall. All were sold directly by the plant to a chainstor organization. The cost of milk and manufacturing costs were both higher for the lot produced during the spring. This is contrary to what usually happens - that is, the cost of milk is less during the flush season, and manufacturing costs are lower because of increased volume processed. Since selling prices were about the same, net processing spread was less in the spring; 2.8 cents per pound as compared to 3.9 and 4.9 for the 2 fall lots. The total marketin bill was higher in the fall and the net price received by farmers was less.

Table 2.--Comparison of prices, price spreads and returns to farmers, per pound of cheddar cheese produced in different seasons

Item	Season						
	Spring	Summer		Fall		Winter	
	1/	Minimum of lot 6	Maximum of lot 6	Minimum	Maximum	Minimum of lot 1	Maximum of lot 2
	Cents	Cents	Cents	Cents	Cents	Cents	Cents
Retail prices	49.00	49.00	55.00	49.00	49.00	39.00	65.00
Wholesale prices	36.50	39.00	39.00	36.25	36.25	37.50	44.00
Retail spreads	---	10.00	16.00	---	---	1.00	27.50
Price paid by wholesaler	---	35.25	35.25	---	---	35.00	36.00
Wholesale spreads	---	3.75	3.75	---	---	2.50	8.00
Total retail-wholesale spreads	2/ 12.50	13.75	19.75	2/ 12.75	12.75	3.50	30.00
Amounts paid to farmers	24.44	26.29	26.29	23.55	24.11	25.44	25.51
Total processing plant spreads	11.06	8.96	8.96	12.64	12.70	9.49	10.56
Manufacturing costs	9.22	7.08	7.08	7.79	8.24	9.57	9.84
Residual plant margins	2.84	1.88	1.88	3.90	4.91	-0.08	.72
Transportation paid by farmer	2.73	3.64	3.64	2.73	2.73	3.64	3.64
Net to farmer	21.71	22.65	22.65	20.82	21.38	21.80	21.87
Total price spreads	27.29	26.35	32.35	27.62	28.18	17.20	43.13
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Farmer's share of retail prices	44	41	46	42	44	56	34

1/ Only one retail price reported.

2/ No separate retail spread, wholesale price, or wholesale spread. Cheese was sold directly by plant to retail chainstore.

LOT ONE

In lot 1, 8,517 pounds of milk were used to produce 963.25 pounds of paraffined cheese, which was composed of 79 red-rind midget cheeses, averaging a little over 12 pounds each in weight. It was made in February. At the plant in which this lot was made, milk is received daily and is brought in mainly by contract haulers. Individual producers may bring in their own milk, thus paying no hauling fees, but they may not bring in other producers' milk since this might disturb the contract haulers' routes.

The milk entered the plant during the morning. The cans of milk were placed on a conveyor by the hauler. After dumping, sampling, and weighing, the milk was pumped through lines to machinery where it was pasteurized and standardized down to approximately 3.8 percent. Sweet cream separated at this stage, like the whey cream separated later on, was sold to a creamery. The skimmed whey was pumped to a tank outside the plant where it was available at no cost to patrons for use on their farms.

The cheese was moved out of the plant to a cold-storage house at a distributing point approximately 330 miles distant. From the cold-storage house, the cheese was moved to various wholesalers, who in turn dealt with retailers. The selling operations at the cold-storage house were carried on by a broker, who acted as agent for the plant making the cheese and charged a flat fee of 0.5 cent per pound of cheese handled. Under normal conditions, all of the cheese made by this particular plant was sold through marketing channels as natural cheddar cheese.

The wholesalers with whom the broker dealt were of 2 kinds--small meatpackers and wholesale grocers. In each case, the cheese was picked up at the cold-storage house by the wholesaler and was delivered by the wholesaler to the retailer. Cheese sold to packers was delivered on trucks along with other dairy and meat products; that sold to wholesale grocers was delivered along with other grocery items, including some fresh fruits and vegetables.

A substantial part of the cheese was sold by the wholesaler to small country retail stores with a relatively low volume of sales. Many of the stores were at country road intersections. Typically, the cheese was kept in a refrigerated display cabinet, with other meat and dairy products. Pieces were cut and weighed for sale on individual customer order. None of the stores visited did any instore prepackaging in transparent materials.

LOT TWO

Lot 2 was made from 7,282 pounds of milk which yielded 823.5 pounds of cheese in 37 clear paraffined daisy cheeses averaging a little over 22 pounds each. The lot was made on the same day in February and in the same plant as lot 1. The reason for selecting 2 lots from the same plant on the same day was to see what difference, if any, existed in the costs for different sizes and styles of hoops. Many of the overhead cost items--because of the allocation procedures employeed--are identical for both lots. But cost differences in the handling procedures for daisies and for midgets warranted taking 2 lots from the same plant on the same day.

The cheese was handled in the plant in much the same manner as the cheese in lot 1, the main differences being the use of a larger hoop and of clear paraffin instead of red paraffin. However, the cheeses were handled in the trade channels in much the same manner. The cheese from lot 2 moved out of storage in the cheese plant to a cold-storage house at a distributing point approximately 350 miles from the point of manufacture.

At the distributing point, a broker represented the cheese plant in selling the cheese and was paid a flat fee of 0.5 cent per pound of cheese sold. The wholesalers were of the same general type as those handling the midgets for lot 1. The cheese moved to small country stores with a relatively small sales volume. The one exception was a medium-sized market in town; in this store (the one charging the highest retail price) the cheese was prepackaged in transparent material.

Another difference showed up in the way the daisy cheeses of lot 2 were handled in retail stores, as compared with the manner in which the midgets were handled. The midget cheeses were generally kept in refrigerated display cases until a customer ordered some. The daisies, however, were sometimes kept up on the counter of the store under the top of a round wood box in which a daisy-size cheese is sometimes packed. When a customer ordered some cheese, the wood cover was lifted and a piece of cheese of a weight approximately that ordered by the customer was cut. The weather was still relatively cool at the time this lot of cheese was observed. During the late spring and summer months, it might be expected that this method of handling the cheese in the retail shop would be unsatisfactory, and the cheese would need to be kept in a refrigerated cabinet.

LOT THREE

The third lot was made from 18,500 pounds of milk, standardized to 3.7 percent butterfat content, which yielded 2,106.25 pounds of cheese. This lot, made in April, was composed of cheeses marketed in a style that is relatively new to the industry. Cheddar cheese has traditionally been packed in the plant in bandages and paraffin and shipped through marketing channels to the retailer in that form. The development of the modern supermarket, however, brought the opportunity for different kinds of packing in the plant and in the retail store. An incentive was provided to produce a cheese that could be easily prepackaged in the store without much loss through crumbling or clinging to a paraffined bandage. The result was the rindless cheese, which has many qualities that are well suited to marketing from display cases in prepackaged form by supermarkets. Lot 3 was composed of 51 rindless cheeses weighing an average of about 41 pounds each, marketed by a supermarket chain.

Except for the hooping and packaging operations, rindless cheese is processed in the same manner as cheese that is marketed in a rinded form. So the remarks made with respect to lots 1 and 2 also apply here. But after the milled curd of lot 3 was salted, it was put in stainless steel, three-piece (top, side, and bottom) boxes, designed to hold an amount of milled curd that will result in an unhooped cheese weighing approximately 42 pounds. These boxes are lined with parchment (2 sheets) instead of the cheesecloth bandage used for the rinded cheeses. After an initial period in the press, the hoops are dressed in much the same manner as for rinded cheeses.

It is in the unhooping and packaging operations that the biggest divergences occur in the handling of rindless and rinded cheeses. In the case of rindless cheese, the new block is immediately wrapped, weighed, and boxed. The wrapping material used is a clear plastic that is effective in keeping out air. Before wrapping, the cheese is examined for imperfections and is trimmed wherever necessary to make a clean attractive block when it arrives at the retail outlet.

The cheese in this lot was stored and aged in the plant, then moved in trucks of a motor freight company to a distributing point approximately 460 miles distant. At the distributing point, the cheese was delivered to the warehouse of a large, modern chainstore company with outlets in the surrounding area. The sale had been arranged by a broker for a fee of 0.25 cent per pound of cheese sold.

The cheese was dispatched from the chainstore warehouse to the retail outlets on company-owned trucks that also carried a full line of groceries. Upon reaching the store, the cheese was placed in a cold room where it was held until cut into pieces and packaged for sale from self-service display cases.

The prepackaging was done in the retail stores at the beginning of the week or at times of day before the "rush" sales periods, when store employees were not busy elsewhere. In a sense, we may say that the prepackaging uses "overhead" labor. The prepackaging operation begins with the removal of the block of cheese from the cold room. The block is raised from the box and the transparent wrapper is removed. The cheese was cut into pieces weighing between 6 and 18 ounces by either a conventional knife or a thin wire blade stretched between the ends of a metal bow attached at one end to the platform upon which the block of cheese rested. With either instrument there was no noticeable crumbling. The cuts were tapered to one end to suggest that the cheese had come from a round form.

The individual pieces of cheese were wrapped in transparent material, sealed by a heating plate, and labeled. Then the cheese was weighed and prices put on the labels. When this was completed, the cheese was either put in a display cabinet or brought back to the cold room.

LOT FOUR

For lot 4, 9,300 pounds of milk, standardized to 3.8 percent butterfat content, yielded 1,046 pounds of cheese which was made into 45 daisy cheeses weighing about 23 pounds each. This lot was produced in May. Operations involved in the manufacture and marketing are similar to those for lots 1 and 2. The cheese was moved to a distributing point approximately 280 miles from the plant, where it was delivered directly to wholesale buyers. The sales were arranged by a broker, who received a flat fee of 0.5 cent per pound of cheese sold. One part of the lot went to a meatpacker, who carried a full line of cheeses in addition to other dairy and meat products. The meatpacker sold the cheeses to retail outlets in the area along with these other items. In the retail stores, the cheese was kept in display cases and was sold on customer's orders.

Another part of the lot went to a wholesale-jobber. The part of the lot followed from this dealer went to retail stores which sold their cheese in the same manner described for the first wholesaler handling the lot. In both cases, the wholesalers dealt with small-volume stores. The second dealer (the wholesaler-jobber) also sells to some other wholesalers. Also, peddlers or employees of country stores may come by to pick up the cheese.

LOT FIVE

Lot 5 was manufactured from 8,000 pounds of milk with 3.7 percent butterfat content; the yield was 879.125 pounds of cheese. The lot was composed of 84 split horns. It was produced in July. A portion of the cheese was sold directly to retailers; some was prepackaged. The hoops, designed by the owner of the plant, were filled on the side instead of through the top. No bandaging was used. The hoops were lined with cotton cloths that were washed and reused many times. The cheese was rindless, and was packed in plastic bags of suitable size upon removal from the press and the hoops.

The plant had routes that were visited once or twice a week by a panel truck carrying a line of manufactured dairy products. The truck was loaded in the morning with several kinds of cheese and butter, and the driver was given a daily list of stops and prices. One route was observed during this study. It was 132 miles long and serviced a wide range of buyers from a purchase of a small piece of aged cheese for individual home consumption to a large order of cheeses and butter for a moderate-sized supermarket.

The cheeses in this lot were sold in 2 ways: As split horns to be cut by the retailer on consumer order, and as prepackaged pieces cut from the split horn and sealed in small plastic bags in the plant.

LOT SIX

Lot 6 consisted of 819.5 pounds of cheese manufactured from 8,000 pounds of milk testing 3.7 percent butterfat. It was made in August and was marketed in much the same way as lot 2. The lot, consisting of 36 daisies, moved to a distributing point about 300 miles from the plant. It was sold by a broker, who was paid 0.5 cent per pound of cheese sold, to a meatpacker who carried a large line of meat and dairy products. The cheeses moved as far as 60 miles from the distributing center and were sold from trucks that had regular routes. Stores handling cheeses from this lot were relatively low-volume outlets.

LOT SEVEN

Lot 7 consisted of 55 rindless blocks weighing a total of 2,281.5 pounds, manufactured in October from 20,000 pounds of milk which tested 3.6 percent butterfat. It was manufactured and marketed in much the same way as lot 3. The lot moved to a distribution point approximately 460 miles from the plant, where it was delivered to the warehouse of a chainstore company. A broker arranged this sale for a fee of 0.25 cent per pound of cheese sold. From the company's warehouse, the cheese moved to retail outlets, where it was cut and prepackaged in the same manner as lot 3.

LOT EIGHT

Lot 8 was manufactured in December from 18,800 pounds of milk with 3.8 percent butterfat content, which yielded 52 rindless blocks weighing a total of 2,150 pounds. The lot was manufactured and marketed in much the same way as lot 3. It moved to a distributing point approximately 530 miles from the plant, where it was delivered to the warehouse of a chainstore company. The sale was made by a broker who charged 0.25 cent per pound of cheese sold. From the company's warehouse, the cheese moved to retail outlets, where it was cut and prepackaged in the same manner as lot 3.

Table 3.--Returns to farmers for milk used in 8 lots of cheddar cheese: Totals and per pound of cheese

Item	Lot number							
	1	2	3 1/	4 2/	5	6	7	8
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
TOTAL PAID TO FARMERS								
Gross paid to farmers	307.27	262.72	533.22	307.35	216.08	251.35	568.08	547.53
Less hauling	35.02	29.94	55.50	40.57	36.00	32.33	60.00	56.40
Net price to farmers for milk	272.25	232.78	477.72	266.78	180.08	219.02	508.08	491.13
Less byproduct recovery								
Whey cream	14.59	12.48	18.54	13.13	13.94	14.18	30.84	29.12
Cream recovery in standardizing	47.67	40.12	---	28.91	---	21.70	---	---
Total byproduct recovery	62.26	52.60	18.54	41.04	13.94	35.88	30.84	29.12
Net price to farmers for milk in cheese	209.99	180.18	459.18	224.74	166.14	183.14	477.24	462.01
Pounds of milk used	*8,517*	*7,282*	*18,500*	*9,300*	*8,000*	*8,000*	*20,000*	*18,800*
Pounds of cheese yield	*963*	*824*	*2,106*	*1,046*	*879*	*820*	*2,282*	*2,150*
FOR MILK USED TO PRODUCE 1 POUND OF CHEESE								
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
Gross paid to farmers	31.9	31.9	25.3	29.4	24.6	30.7	24.9	25.4
Less hauling	3.6	3.6	2.6	3.9	4.1	4.0	2.6	2.6
Net price to farmers for milk	28.3	28.3	23.7	25.5	20.5	26.7	22.3	22.8
Less byproduct recovery								
Whey cream	1.5	1.5	.9	1.3	1.6	1.7	1.4	1.4
Cream recovery in standardizing	4.9	4.9	---	2.8	---	2.6	---	---
Total byproduct recovery	6.4	6.4	.9	4.1	1.6	4.3	1.4	1.4
Net price to farmers for milk in cheese	21.9	21.9	22.8	21.4	18.9	22.4	20.9	21.4

1/ Milk for this lot was purchased from farmers on a butterfat content basis (without a base price). The total paid to farmers is based upon the milk used in cheese and there is no recovery of butterfat by standardizing.

2/ Hauling paid by farmers. Hauling subsidy paid by the plant is not included.

Table 4.--Manufacturing costs for producing 8 lots of cheddar cheese: Totals and per pound of cheese

Item	Lot number							
	1	2	3	4	5	6	7	8
TOTAL MANUFACTURING COSTS								
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Raw material cost								
Milk	245.01	210.12	514.68	265.31	202.14	215.47	537.24	518.41
Other 1/	6.49	5.33	21.80	5.42	4.25	9.30	22.80	21.57
Total	251.50	215.45	536.48	270.73	206.39	224.77	560.04	539.98
Expenses								
Plant labor	21.50	15.99	25.10	17.66	19.92	13.42	32.28	26.69
Packaging	13.65	12.04	36.34	11.90	7.11	11.77	39.31	37.08
Depreciation, repairs, and maintenance charges	11.40	9.74	23.81	6.23	10.47	4.82	41.42	44.79
Utilities	8.65	7.39	5.49	3.77	8.35	3.74	11.39	12.91
Office expenses	16.96	14.50	6.95	6.51	9.88	7.19	12.23	13.07
Storage	3.00	2.70	---	5.23	---	---	---	---
Taxes and licenses	2.45	2.10	2.29	.63	1.21	1.04	4.03	4.30
Insurance	2.19	1.87	1.10	.76	.63	.93	1.94	2.03
Other	3.55	3.04	3.50	.67	1.53	1.68	6.14	6.55
Total expenses	83.35	69.37	104.58	53.36	59.10	44.59	149.24	150.42
Brokerage fees	4.82	4.12	5.27	5.23	---	4.10	5.70	5.38
Total cost	339.67	288.94	646.33	329.32	265.49	273.46	714.98	695.78
Pounds of milk used	*8,517*	*7,282*	*18,500*	*9,300*	*8,000*	*8,000*	*20,000*	*18,800*
Pounds of cheese yield	*963*	*824*	*2,106*	*1,046*	*879*	*820*	*2,282*	*2,150*
COSTS PER POUND OF CHEESE								
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
Raw material cost								
Milk	25.4	25.5	24.5	25.4	23.0	26.3	23.5	24.1
Other 1/	.7	.7	1.0	.5	.5	1.1	1.0	1.0
Total	26.1	26.2	25.5	25.9	23.5	27.4	24.5	25.1
Expenses								
Plant labor	2.2	1.9	1.2	1.7	2.3	1.6	1.4	1.4
Packaging	1.4	1.5	1.7	1.1	.8	1.4	1.7	1.7
Depreciation, repairs, and maintenance charges	1.2	1.2	1.1	.6	1.2	.6	1.8	2.1
Utilities	.9	.9	.3	.4	.9	.5	.5	.6
Office expenses	1.8	1.8	.3	.6	1.1	.9	.5	.6
Storage	.3	.3	---	.5	---	---	---	---
Taxes and licenses	.3	.3	.1	.1	.1	.1	.2	.2
Insurance	.2	.2	.1	.1	.1	.1	.1	.1
Other	.4	.4	.2	.1	.2	.2	.3	.3
Total expenses	8.7	8.5	5.0	5.2	6.7	5.4	6.5	7.0
Brokerage fees	.5	.5	.2	.5	---	.5	.2	.2
Total cost	35.3	35.2	30.7	31.6	30.2	33.3	31.2	32.3

1/ Includes raw materials such as rennet, starter, coloring, and salt.

Table 5.--Minimum and maximum prices and marketing costs per pound of cheese for 8 lots of cheddar cheese

Item	Lot number												
	1		2		3	4		5		6		7	8
	Minimum amounts	Maximum amounts	Minimum amounts	Maximum amounts	Sold directly to retail chainstore	Minimum amounts	Maximum amounts	Minimum amounts	Maximum amounts	Minimum amounts	Maximum amounts	Sold directly to retail chainstore	Sold directly to retail chainstore
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
Retail prices..........	39.0	59.0	55.0	65.0	49.0	41.0	69.0	55.0	60.0	49.0	55.0	49.0	49.0
Wholesale prices.......	38.0	44.0	37.5	37.5	---	37.0	39.0	---	---	39.0	39.0	---	---
Retail spreads.........	1.0	21.0	17.5	27.5	---	4.0	30.0	---	---	10.0	16.0	---	---
Prices paid by wholesalers...............	35.5	36.0	35.0	35.0	1/36.5	36.0	36.0	1/39.0	1/42.0	35.2	35.2	1/36.2	1/36.2
Wholesale spreads......	2.5	8.0	2.5	2.5	---	1.0	2.0	---	---	3.8	3.8	---	---
Total retail-wholesale spreads..............	3.5	23.5	20.0	30.0	12.5	5.0	33.0	16.0	18.0	13.8	19.8	12.8	12.8
Amounts paid to farmers	25.4	25.4	25.5	25.5	27.3	25.4	25.4	23.0	23.0	26.3	26.3	28.2	27.6
Total processing plant spreads..............	10.1	10.6	9.5	9.5	11.1	10.6	10.6	16.0	19.0	8.9	8.9	12.7	12.1
Manufacturing costs 2/	9.8	9.8	9.6	9.6	6.2	6.0	6.0	7.2	15.3	7.1	7.1	7.8	8.2
Residual plant margins.	0.2	0.7	0.1	0.1	4.9	4.6	4.6	3.7	8.8	1.8	1.8	4.9	3.9
Transportation paid by farmers..............	3.6	3.6	3.6	3.6	2.7	3.6	4.1	4.1	4.1	3.6	3.6	2.7	2.7
Net to farmers.........	21.8	21.8	21.9	21.9	21.7	21.3	21.8	18.9	18.9	---	---	20.8	21.4
Total price spread.....	17.2	37.2	33.1	43.1	24.4	19.2	47.7	36.1	41.1	26.6	32.6	23.5	24.1
	Percent		Percent		Percent	Percent		Percent		Percent		Percent	Percent
Farmer's share of retail price.........	37	56	34	40	44	31	53	31	34	41	46	42	44

1/ No separate retail spread, wholesale price,or wholesale spread as cheese was sold directly by plant to retail chainstore.
2/ Includes expenses, brokerage fees,and raw material other than milk.

These tables are listings of minimum and maximum amounts and do not balance internally.

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